

## CLAIMS

1. A semiconductor workpiece processing tool comprising:
  - a plurality of process modules for processing the workpiece, where a number of the process modules include a robot loading window;
  - a control system for managing operation of the processing tool including a production route defining movement of the workpiece among a number of the process modules, wherein the control system includes:
    - (a) a user interface through which an operator can define the production route and recipes to be performed on the workpiece in each of the process modules;
    - (b) a system controller for controlling execution of the production route;
    - (c) a process module controller associated with each of the process modules for controlling the processing of the workpiece in the process module; and
    - (d) a network connecting the user interface, system controller and each process module controller;
  - wherein the control system is configured to select the next process module in the production route when a workpiece is substantially completed with an existing process in the production route.
2. The processing tool of claim 1, wherein:
  - the production route includes a number of on-line process modules defined in the production route and at least one off-line process module not included in the production route.
3. The processing tool of claim 1, wherein:
  - the control system is configured to route the workpiece in the production route based at least in part on process module fault conditions.
4. The processing tool of claim 2, wherein:
  - the control system is configured to route the workpiece in the production route based at least in part on process module fault conditions.
5. The processing tool of claim 1, wherein:

each process module controller is capable of retrieving a recipe over the network based on a recipe identifier.

6. The processing tool of claim 3, wherein:

each process module controller is capable of retrieving a recipe over the network based on a recipe identifier.

7. The processing tool of claim 4, wherein:

each process module controller is capable of retrieving a recipe over the network based on a recipe identifier.

8. The processing tool of claim 5, wherein:

the system controller is configured to route the workpiece to an available process module based on the production route.

9. The processing tool of claim 6, wherein:

the system controller is configured to poll for an available process module based on the production route.

10. The processing tool of claim 5, wherein:

the system controller is configured to store process module status information and use the process module status information to determine the next process module in the production route.

11. The processing tool of claim 1, wherein:

a number of the process modules include a manual loading window; and  
the production route includes a number of on-line process modules defined in the production route and at least one off-line process module not included in the production route that can be configured to perform testing, maintenance or other operation while the production route is in operation.

12. A method of processing a workpiece using a semiconductor workpiece processing tool

including a plurality of process modules having a robot loading window and a control system

including a user interface, system controller and process module controller associated with the process modules, comprising the steps of:

storing a production route defining movement of the workpiece among a number of the process modules;

storing a number of recipes for processing the workpiece, the recipes each having a unique name and a number of processing parameters associated therewith;

selecting the next process module in the production route when a workpiece is substantially completed with an existing process in the production route; and

moving the workpieces among the process modules in accordance with the selecting step.

13. The method of claim 12, wherein:

the production route includes a number of on-line process modules defined in the production route and at least one off-line process module not included in the production route.

14. The method of claim 12, wherein:

the selecting step routes the workpiece in the production route based at least in part on process module fault conditions.

15. The method of claim 13, wherein:

the selecting step routes the workpiece in the production route based at least in part on process module fault conditions.

16. The method of claim 12, further comprising the step of:

a selected process module retrieving a recipe over the network based on a recipe identifier.

17. The method of claim 14, further comprising the step of:

a selected process module retrieving a recipe over the network based on a recipe identifier.

18. The method of claim 15, further comprising the step of:

a selected process module retrieving a recipe over the network based on a recipe identifier.

19. The method of claim 16, wherein:

the selecting step routes the workpiece to an available process module based on the production route.

20. The method of claim 17, wherein:

the selecting step routes the workpiece to an available process module based on the production route.

21. The method of claim 16, further comprising the step of:

storing process module status information; and

wherein the selecting step includes the step of using the process module status information to determine the next process module in the production route.

22. The method of claim 12, wherein a number of the process modules include a manual loading window, and wherein:

the production route includes a number of on-line process modules defined in the production route and at least one off-line process module not included in the production route that can be configured to perform testing, maintenance or other operation while the production route is in operation.